SLOVENSKI STANDARD
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Sectional specification: Fixed polypropylene film dielectric metal foil d.c. capacitors

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Rahmenspezifikation: Kunststoffolien-KP-Kondensatoren für Gleichspannungsanwendungen

Spécification intermédiaire: Condensateurs fixes pour courant continu à diélectrique en film de polypropylène et à armatures en feuilles métalliques

Ta slovenski standard je istoveten z: **EN 131800:1997**

ICS:

31.060.30	Papirni kondenzatorji in folijski kondenzatorji	Paper and plastics capacitors

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EUROPEAN STANDARD

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English version

Sectional Specification:
Fixed polypropylene film dielectric metal foil d.c. capacitors

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 131800:1997 E

Foreword

At the request of CLC/TC CECC/SC 40XA (former WG 3), the text of CECC 31 800:1985, Issue 1, with its amendments A1 and A3 through A9 and documents CECC(Secretariat)3061 and 3083, was submitted to the formal vote for conversion into a European Standard.

The text of the draft, together with the voting report, circulated as document CECC(Secretariat)3232, was approved as EN 131800 on 1992-10-14.

Based on the positive voting results on prAB to EN 130800, assessment level EZ was accepted for introduction into EN 131800 on 1997-03-11.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-04-01

Contents

Section 1: General

1.1 Scope

This European Standard specifies requirements for fixed capacitors for direct current, using as dielectric a polypropylene film and electrodes of thin metal foils. The capacitors covered by this specification are intended for use in electronic equipment.

It specifies preferred ratings and characteristics and selects from EN 130000 the appropriate quality assessment procedures, tests and measuring methods and gives general performance requirements for this type of capacitor.

Capacitors for direct connection to the supply mains to provide radio interference suppression are not included.

1.2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 130000 Amendments 1 to 10	1993	Generic specification: Fixed capacitors
IEC 60062	1974	Marking codes for resistors and capacitors
IEC 60063 Amendment 1 Amendment 2	1963 1967 1977	Preferred number series for resistors and capacitors
IEC 60068		Basic environmental testing procedures
IEC 60410	1973	Sampling plans and procedures for inspection by attributes
ISO 3	1973	Preferred numbers - Series of preferred numbers

1.3 Information to be given in a detail specification

1.3.1 General

Detail specifications shall be derived from the relevant blank detail specification.

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in 1.9 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE: The information given in 1.3.2 may, for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.3.2 Outline drawing and dimensions

There shall be an illustration of the capacitor as an aid to easy recognition and for comparison of the capacitor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions are preferably to be stated in millimetres.

Normally the numerical values shall be given for the length, the width and height of the body and the wire spacing, or for cylindrical types, the body diameter, and the length and diameter of the terminations. When necessary, for example when a number of items (capacitance values/voltage ranges) is covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the capacitor. When the capacitor is not designed for use on printed boards, this shall be clearly stated in the detail specification.

1.3.3 Mounting

The detail specification shall specify the method of mounting to be applied for the application of the vibration and the bump or shock tests. The design of the capacitor may be such that special mounting fixtures are required in its use. In this case the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

NOTE: If recommendations for mounting for "normal" use are made, they shall be included in the detail specification under "1.8 Additional information (Not for inspection purposes)". If they are included a warning can be given that the full vibration, bump and shock performance may not be available if mounting methods other than those specified in 1.1 of the detail specification are used.

1.3.4 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification, together with the following.

a) Rated capacitance range

See 2.2.1.

NOTE: When products approved to the detail specification may have different ranges, the following statement should be added: "The range of values available in each voltage range is given in the Register of firms, products and services approved under the CECC system (Register of approvals), CECC 00200".

b) Particular characteristics

Additional characteristics may be listed, when they are considered necessary to specify adequately the component for design and application purposes.

1.3.5 Marking

The detail specification shall specify the content of the marking on the capacitor and on the package.

1.4 Definitions

For the purposes of this standard the definitions given in EN 130000 apply, together with the following.

1.4.1 stability class

The stability class is defined by the tolerance on the temperature coefficient together with the permissible change of capacitance after defined tests. The stability class is stated in the detail specification. Table 2 shows the preferred stability classes.

1.4.2 Rated voltage

The rated voltage is the maximum d.c. voltage which may be applied continuously to a capacitor at the rated temperature.

NOTE: The sum of the d.c. voltage and the peak a.c. voltage applied to the capacitor shall not exceed the rated voltage. The value of the peak a.c. voltage shall not exceed the following percentages of the rated voltage at the frequencies stated and shall be not greater than 280 V:

50	Hz: 20 %
100	Hz: 15 %
1 000	Hz: 3 %
10 000	Hz: 1 %

unless otherwise specified in the detail specification.

1.5 Marking

1.5.1 See 2.4 of EN 130000:1993, with the details given in 1.5.2 to 1.5.5.

1.5.2 The information given in the marking is normally selected from the following list; the relative importance of each item is indicated by its position in the list:

a) rated capacitance;

b) rated voltage (d.c. voltage may be indicated by the symbol ⎓ or ⎓);

c) tolerance on rated capacitance;

d) year and month (or week) of manufacture;

e) manufacturer's name or trade mark;

f) climatic category;

g) manufacturer's type designation;

h) reference to the detail specification.

1.5.3 The capacitor shall be clearly marked with a), b) and c) of 1.5.2 and with as many as possible of the remaining items as is considered necessary. Any duplication of information in the marking on the capacitor should be avoided.

1.5.4 The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.5.2.

1.5.5 Any additional marking shall be so applied that no confusion can arise.

Section 2: Preferred ratings and characteristics

2.1 Preferred climatic categories

The capacitors covered by this specification are classified into climatic categories according to the general rules given in IEC 60068-1.

The lower and upper category temperatures and the duration of the damp heat, steady state tests shall be chosen from the following:

lower category temperature: - 55 °C, - 40 °C, - 25 °C and - 10 °C;

upper category temperature: + 85 °C, and + 100 °C;

duration of the damp heat, steady state test: 4[1], 10, 21 and 56 days.

The severities for the cold and dry heat tests are the lower and the upper category temperatures respectively.

Assisted drying is conditioning for a period between 1 h and 6 h at a temperature of (55 ± 2) °C and a relative humidity not exceeding 20 %.

2.2 Preferred values of ratings

2.2.1 Rated capacitance (C_R)

Preferred values of rated capacitance shall be taken from the series E6, E12, E24, E48 and E96 given in IEC 60063.

2.2.2 Tolerance on rated capacitance

Preferred tolerances on the rated capacitance are given in table 1.

Table 1: Preferred tolerances

Preferred series	Preferred tolerance	Tolerance code
E6	± 20 %	M
E12	± 10 %	K
E24	± 5 %	J
E48	± 2 %	G
E96	± 1 %	F

[1] With assisted drying, if required.

In any case the minimum tolerance is ± 1 pF. Additional values of capacitance outside the E96 range and additional tolerances may be specified.

2.2.3 Rated voltage (U_R)

The preferred values of rated voltage are:

40; 63; 100; 160; 250 V and their decimal multiples.

These values conform to the basic series of preferred values R5 given in ISO 3.

2.2.4 Preferred nominal temperature coefficients (α) with associated tolerances and preferred values of permissible change of capacitance

The values are given in table 2 and also the preferred combinations of these values. The table is not valid for capacitance values smaller than 50 pF.

Table 2: Preferred nominal temperature coefficient and permissible change of capacitance

Stability class	Temperature coefficient and tolerance (10^{-6}/°C)					Permissible change of capacitance[1] Upper category temperature	
	- 80	- 100	- 125	- 160	- 250	85 °C	100 °C
1	± 40	± 50	± 60	± 80	± 120	± (0,5 % + 0,5 pF)	± (1 % + 0,5 pF)
2		± 100	± 125	± 160	± 250	± (1 % + 1 pF)	± (2 % + 1 pF)
				± 160	± 250	± (2 % + 2 pF)	± (5 % + 2 pF)
X	Not defined					± (2 % + 2 pF)	± (5 % + 5 pF)

[1] Permissible change of capacitance after test as required.

2.2.5 Category voltage (U_C)

At 85 °C the category voltage is equal to the rated voltage (U_R). For the upper category temperature of 100 °C the category voltage is equal to $0{,}7U_R$.

2.2.6 Rated temperature

The standard value of rated temperature is 85 °C.

Section 3: Quality assurance procedures

3.1 Primary stage of manufacture

The primary stage of manufacture is the winding of the capacitor element or the equivalent operation.

3.2 Structurally similar components

Capacitors considered as being structurally similar are capacitors produced with similar processes and materials, though they may be of different case sizes and capacitance and voltage values.

3.3 Certified test records

The information required in 3.9 of EN 130000:1993 shall be made available when specified in the detail specification and when requested by a purchaser. After the endurance test the parameters for which variables information is required are the capacitance change, tan δ and the insulation resistance.

3.4 Qualification approval

3.4.1 General

The procedures for qualification approval testing are given in 3.5 of EN 130000:1993. The schedule to be used for qualification approval testing on the basis of lot-by-lot and periodic tests is given in 3.5 of this specification. The procedure using a fixed sample size schedule is given in 3.4.2 and 3.4.3.

3.4.2 Sampling

The fixed sample size procedure is described in 3.5.3.2 of EN 130000:1993. The sample shall be representative of the range of capacitors for which approval is sought. This may or may not be the complete range covered by the detail specification.

The sample shall consist of specimens having the lowest and highest voltages, and for these voltages the lowest and highest capacitances. When there are more than four rated voltages an intermediate voltage shall also be tested. Thus for the approval of a range, testing is required of either four or six values (capacitance/voltage combinations). When the range consists of less than four values, the number of specimens to be tested shall be that required for four values.